

(each raised to 100*l.*), Bushe-Fox, Kirby, Mossop, Foster Hill. Natural Science and Medicine: Shore, Rolleston, Seward.

Exhibitions.—Mathematics: Holmes, Middlemast, Pressland, Roseveare, Bushe-Fox, Foster, Flux. Natural Science and Medicine: Rolleston, Olive, Jones. Natural Science: Evans, Rendle, Lake.

Proper Sizarships.—Mathematics: Norris, Varley.

Hughes Prizes.—Mathematics: Love. Natural Science: Shore.

Wright Prizes.—Mathematics: Fletcher, Bakre, and Flux (equal).

Herschel Prize (for Astronomy).—Bushe-Fox.

Hockin Prize (for Electricity).—Not awarded.

The Hutchinson Studentship (NATURE, May 28, p. 90) was awarded to Ds. Rapson (First Class, Classical Tripos 1883-85, and Indian Languages Tripos 1885) to assist him in the prosecution of his studies in Sanskrit literature.

The next Adams Prize will be adjudged in 1887. The subject is Ellipsoidal and Spheroidal Harmonic Analysis, attention being particularly drawn to the reduction of the formulæ in this calculus to practical forms adapted to numerical calculation. Since, with the exception of spherical harmonics, this method has remained almost barren in physical investigations, actual illustrations of its utility are invited. The essays must be sent in by December 16, 1886, and any Cambridge graduate may compete. The successful candidate will receive 170*l.*; he must print the essay at his own expense.

The Mathematical Board recommend that four separate examiners be appointed for the final portion of the Mathematical Tripos, in the hope of inducing more specially qualified professors and specialists to undertake this advanced work.

The Annual Report of the Observatory gives a very satisfactory record of progress. Among the 3253 observations with the transit circle were 2442 of zone stars on 100 nights, the greater number at five or seven wires, and all read off with four microscopes. The reductions of observations are in a forward state.

At the Botanical Gardens during the past year the collection of insectivorous plants has been greatly improved. A number of new or rare species have flowered—some for the first time in this country. A speciality has been made of *Salvia*, and four species from this garden have been figured in the *Botanical Magazine*.

A grant not exceeding 100*l.* is to be made to C. S. Sherrington, M.B., of Gonville and Caius College, from the Worts Travelling Scholars Fund, to enable him to proceed to Valentia to investigate the experiments now being made by Dr. Ferrand on inoculation as a preventive against cholera.

SCIENTIFIC SERIALS

IN the *Journal of Botany* for May and June Mr. W. B. Grove continues his paper on "new or noteworthy fungi," which is well illustrated. Several new species are described, and one new genus, *Diplococcium*, near to *Cladotrichum*.—Mr. S. Le M. Moore identifies *Bacterium fetidum*, Thin, found in association with profuse sweating of the soles of the feet, with the ordinary micrococcus of surface soil.—Mr. H. N. Dixon adds a new species to the British moss flora, *Catharinaea dixonii*, from Northampton.—Mr. R. D. Fitzgerald and Mr. H. N. Ridley describe new Orchids; and Rev. B. Scortechini a new genus of Myrtaceæ, *Pseudoerigenia*, from the Malay Peninsula.—Dr. H. Trimen sends some notes on the flora of Ceylon, and Rev. W. H. Purchas contributes notes on Dovedale plants.

Rivista Scientifico Industriale, May 15.—A new explanation of the red after-glow (continued), by Prof. Carlo Marangoni.—On the diathermicity of fluids, by A. Volta.—Some electric phenomena associated with rarefied gases, by Emilio Piazzoli.—Variations in the electric resistance of solid and pure metal wires according to the temperature (concluded), by Prof. Angelo Emo.

Bulletin de l'Académie Royale de Belgique, April 4.—Crystallographic note on some specimens of calcite from the Carboniferous limestone of Blaton.—Note on the recent appearance of a school of whales (*Balæna biscayensis*) on the east coast of the United States, by M. P. J. Van Beneden.—Account of the discovery of a gigantic Mosasaurian (*Hainosaurus*) in the chalk formation of Mesvin-Ciply near Mons, Belgium, by M. E. Dupont.—On Riccati's equation and its double generalisation, by M. J. de Tilly.—State of the vegetation during the month of

March at Liège and Longchamps-sur-Geer, Belgium, by Baron de Selys Longchamps.—On the presence of Condroz graywacke in the neighbourhood of Beaumont, Entre-Sambre-et-Meuse, by M. Michel Mourlon.—On the porphyries of Bierghes, by M. A. Renard.—On the tension of saturated vapours: a modification of the atomic law of Dalton, by M. P. de Heen.—The Roumanians in the Middle Ages: a historical puzzle, by M. A. D. Xenophol.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 18.—"The Action of Tidal Streams on Metals during Diffusion of Salt and Fresh Water. Experimental Research, Part II. (Gravimetric)." By Thomas Andrews, F.R.S.E. Communicated by Prof. G. G. Stokes, Sec.R.S.

In a paper last session on "The Electromotive Force during Diffusion in Tidal Streams" (see *Proc. Roy. Soc.*, No. 232), the author recorded the electrical part of this investigation. The present communication contains the concluding gravimetric experiments of the research. The effects attending the diffusion of the salt and fresh water in tidal estuaries, on parts of the same metal, of known composition and general properties, were estimated in each case for a period of one year, during which bright plates of the following metals—viz., wrought iron (combined carbon, none), "soft" Bessemer steel (c.c. 0.15), "soft" Siemens-Martin steel (c.c. 0.17), "soft" cast steel (c.c. 0.46), "hard" Bessemer steel (c.c. 0.51), best cast metal, "No. 1" (c.c. 0.39), common cast metal, "No. 2" (c.c. 0.67), were constantly exposed to conditions of galvanic action similar to those obtaining in some tidal streams. The results demonstrate that electric disintegration of the nature alluded to in this and the former paper (viz., the galvanic destructive action on parts of even the same metal, arising from difference of electrical potential during diffusion between the surface and lower waters in a tidal stream) is, on comparison with other investigations by the author, apparently of much greater extent than the loss either from simple corrosion in sea water alone, or than that which ensues from the action on each other of dissimilar metals of this group (such as wrought irons, cast metals, and steels) in galvanic connection in sea water. Compared with simple corrosion in sea water only, the increase in loss varied from about 15 up to 50 per cent., according to the nature of the metals. The results of the experiments in this and the former paper indicate, therefore, that the tidal action on any vessel or metallic structure, of sea and fresh water whilst diffusing is (in the case even of the same metal thus exposed to the simultaneous action of top and bottom waters) considerably more destructive in its nature and character than the action of sea water alone. Moreover, the author has found it (in other experiments) extending over long periods to considerably exceed (in some instances varying from about 55 to 120 per cent.) the loss caused by galvanic action between dissimilar metals of the iron and steel group in circuit in sea water.

Geological Society, May 27.—Prof. T. G. Bonney, F.R.S., President, in the chair.—George Ormond Kekewich was elected a Fellow of the Society.—The following communications were read:—On the so-called diorite of Little Knott (Cumberland), with further remarks on the occurrence of Picrites in Wales, by Prof. T. G. Bonney, F.R.S., Pres.G.S. The Little Knott rock and its microscopic structure were briefly described by the late Mr. Clifton Ward, who named it a diorite, but called attention to its abnormal character. The author gave some additional particulars, and showed that, although the rock varies in different parts of the same outcrop, and is not one of the most typical representatives of the picrite group, its relations on the whole are with this rather than with the true diorites. He also called attention to the extraordinary number of boulders which have been furnished by this comparatively small outcrop, and discussed the relation of their distribution to the former extension and effects of ice in the Lake District. He briefly noticed the occurrence of additional boulders of picrite in Anglesey, and described specimens from two localities (Caemawr and Pengorhwyysfa) where a similar rock has been discovered *in situ* by Prof. Hughes. Hence it is probable that the Anglesey boulders are derived from localities in that island, and not from Cumberland. From a re-examination of specimens collected by the late Prof. Sedgwick and Mr. Tawney, preserved in the Woodwardian Museum at Cambridge, the author showed that the rock must occur *in situ* in two localities in the Lley

peninsula—in the neighbourhood of Clynngog and of Aberdaron. Lastly, he described a very remarkable picrite boulder, discovered by Dr. Hicks, which rests on "Dimetian" rock at Porthlisky near St. David's.—Sketches of South-African Geology; No. 2, a sketch of the gold-fields of the Transvaal, South Africa, by W. H. Penning, F.G.S. The gold-fields of the Transvaal have been defined as covering nearly all the eastern and northern districts of the State, though but a small portion of the area is productive. In this paper the author described only the Lydenburg and De Kaap gold-fields, leaving those of Pretoria and Marabastadt for a future communication. The auriferous region is known to extend 350 miles to the northward beyond the Limpopo River, so that the gold-bearing rocks are found throughout at least $7\frac{1}{2}$ degrees of latitude and 3 of longitude. The area of the two gold-fields mentioned, comprising together about 3000 square miles, was defined; and the author, after noticing some old gold-workings, proceeded to give an account of the physical features of the country. He especially called attention to the circumstance that most of the rivers rise to the west of the highest range, and flow eastward through it. The oldest gold-bearing rocks consist of unfossiliferous schists, shales, cherts, and quartzites, classed by the author as Silurian. Amongst these a great mass of coarse granitic rock is intruded, consisting of quartz and felspar, with but little, if any, mica. This granite, in the De Kaap valley, forms an ellipse seventeen miles long by ten broad, with a narrow northerly prolongation. Both the granite and the stratified rock are traversed by intrusive dykes, chiefly of diorite. These beds have been much disturbed and then cut down, probably by marine denudation, to a level plain 1700 or 1800 feet above the sea. Upon them rest unconformably a great sequence of conglomerates, sandstones, and shales, the "Megaliesberg beds" of a former paper, but now provisionally classed as Devonian. These rocks also are traversed by dykes of diorite and other kinds of trap. The "High Veldt beds" overlie the "Devonian" with some unconformity. Several sections and observations illustrative of these facts were described, and details were given of the different gold-mines in each of the great systems noticed, and also in alluvial deposits. It was shown that much gold was derived originally from veins in the older or Silurian rocks, and that some of that met with in the newer system occurred in conglomerates or other detrital beds. But there are also gold-bearing quartz-veins intersecting the latter.—On some erratics in the boulder-clay of Cheshire, &c., and the conditions of climate they denote, by Charles Ricketts, M.D., F.G.S.

Royal Meteorological Society, June 17.—Mr. R. H. Scott, F.R.S., President, in the chair.—Lieut. A. Leeper, R.N., was elected a Fellow of the Society.—The following papers were read:—A few meteorological observations made on a voyage up the Nile in February and March, 1885, by Dr. W. Marcet, F.R.S. The author, on a voyage up the Nile from Cairo to Assouan, made a series of meteorological observations, and in the present paper gives the results of those relating mainly to nocturnal radiation and the temperature of the water of the Nile.—The mean direction of cirrus clouds over Europe, by Dr. H. H. Hildebrandsson, Hon. Mem. R. Met. Soc. The author has collected a number of observations on the movements of cirrus clouds over various parts of Europe, and after discussing them has arrived at the following results: (1) the mean direction at all stations lies between south-west and north-west; (2) in winter the cirri come from a more northerly direction, and in summer from a more southerly; (3) in winter the northerly component is greater on the Baltic and the north coast of the Mediterranean; (4) the mean directions of the upper currents nearly coincide with the mean tracks of storm-centres; (5) the upper currents of the atmosphere tend in general to flow away from those areas in which a barometrical depression exists at the earth's surface towards those in which there is an elevation of pressure.—On the influence of accumulations of snow on climate, by Dr. A. Woeikoff, Hon. Mem. R. Met. Soc.—Note on the weather of January, 1881, by Mr. E. Harding, F.R. Met. Soc. It will be remembered that the weather of January, 1881, was remarkable for the prolonged and exceptionally severe frost, the heavy gale of the 18th and 19th, and the snowstorms. The author has prepared isobaric charts for the North Atlantic and adjacent continents for January, 1881, and compared it with similar charts for January in other years. He shows that the severe weather in 1881 was due to a reversal of the normal conditions, the atmospheric pressure being high in the north and low in the south.—Results of meteorological observations made in the Solomon Group, 1882–84, by

Lieut. A. Leeper, R.N.—Graphic hygrometrical table, by Mr. D. Cunningham, M. Inst. C. E., F.R. Met. Soc.

Geologists' Association, June 5.—Wm. Topley, F.G.S., President, in the chair.—A paper was read by Mr. Herbert Goss, F.L.S., on some recently-discovered Insecta and Arachnida from Carboniferous and Silurian Rocks. The author stated that in 1879 only 103 fossil insects from the Carboniferous rocks of the whole world were known, but during the last five years a great number had been discovered, including about 1400 from Commeny, France, a few from Saarbrück, Klein Opitz, Lugau, and elsewhere on the Continent of Europe, and a considerable number from various parts of the North American Continent. The specimens were enumerated, some of the most remarkable forms were referred to in detail, and attention was drawn to their affinities with existing types. Many of the specimens were of gigantic size and in a fine state of preservation, and whilst the majority of them appeared referable to forms allied to existing genera of *Hemiptera*, *Neuroptera*, and *Orthoptera*, a considerable number consisted of synthetic types intermediate between these orders, uniting in themselves certain peculiarities of structure now characteristic of distinct orders. Attention was also called to the recent discovery of fossil scorpions in the Upper Silurian of the Isle of Gothland and Scotland, and the wing of a cockroach in the Middle Silurian of Jurques, Calvados, France. Prior to these discoveries no remains of terrestrial animals had been obtained from any strata older than the Devonian, and the result of their discovery in Silurian strata was to leave the *Insecta* the oldest known class of land animals, and the *Blattida* the oldest family of insects. The evidence afforded by Palæontology was therefore, as far as it went, in support of the views as to the origin of insects and the order of succession of the various groups previously arrived at from a study of the embryology of the class.

EDINBURGH

Royal Society, June 1.—Robert Gray, Vice-President, in the chair.—The Astronomer-Royal for Scotland showed the solar spectrum, as observed last year by him, drawn to scale 80 feet long. He contrasted it with the spectrum as seen by Fizeau, and with that as seen by himself some years ago, a special object being to determine the effect of the present cosmic dust.—Prof. Tait gave a number of perfectly general methods of enumerating the amphicheiral knots of any order, and pointed out the curious fact that amphicheirals may in many cases be transformed into other amphicheirals, sometimes in more than one way.—Mr. Hugh Robert Mill, B.Sc., communicated a paper on the chemistry of Japanese lacquer (*Urushi*), by Mr. Hikokuro Yoshida, chemist to the Imperial Geological Survey of Japan. Lacquer juice was found to consist of a monobasic acid (*Urushic acid*), a small proportion of a nitrogenous diastatic matter, gum arabic, and water. The hardening of lacquer was shown to be due to the oxidation of the urushic acid to oxy-urushic acid by the action of the nitrogenous substance in the presence of air and moisture, a number of experiments distinctly proving that it was not a case of hydration. Coloured lacquers are made by the addition of metals, their sulphides, or oxides, to the juice, which exerts no action upon them, except in the case of *roiro* or black lacquer, the colour of which is due to the presence of urushiate of iron produced by the addition of iron filings to the juice.—In a paper on atmospheric electricity at Dodabetta, Prof. C. Michie Smith pointed out that the forenoon observations show a mean curve of atmospheric potential rising to a maximum at about the period of maximum temperature. There is probably a much less marked night maximum, with, of course, a minimum between each maximum. From observations made on some exceptionally fine days, an afternoon curve was constructed. The afternoon observations, however, were usually much modified by mists, but the important fact was established that the potential was regularly less than the normal in a dissipating mist, and much above the normal in a condensing mist.—The Astronomer-Royal for Scotland exhibited a series of star-photographs.

PARIS

Academy of Sciences, June 15.—Note on MM. Paul and Prosper Henry's apparatus for photographing the heavenly bodies, by M. Mouchez. The author presented to the Academy the already executed chart of a section of the Milky Way, including about 5000 stars from the sixth to the fifteenth magnitude comprised in the space between $2^{\circ} 15'$ right ascension and 3° declination. To complete the representation of the 41,000 superficial

degrees of the firmament there will be needed 6000 similar sections forming 1500 of our ecliptical charts. Were the work undertaken by six or eight observatories well situated in the two hemispheres, the whole might be concluded in about five or six years. Such a work, containing the photographs of over 20 million stars down to the 14th or 15th magnitude, and bequeathing to future astronomers an exact picture of the starry regions at the close of the nineteenth century, would certainly be the greatest astronomic undertaking ever carried out.—Remarks on the study of the various floras and faunas in their relations to physical geography and the geology of the globe, by M. Emile Blanchard.—Remarks on M. Alfred Grandidier's "Avifauna of Madagascar," completing the third and last volume of that naturalist's great work on the "Physical and Political History of Madagascar," by M. Alph. Milne-Edwards.—Note on the fourth part of the Map of Algeria to the scale of 1:50,000, and on the second and third sheets of the Ordnance Map of France, presented to the Academy by M. Perrier.—Experimental researches on the diphtheric affections of animals, by M. G. Colin.—Observations of Palisa's new planet 248, made at the Paris Observatory (equatorial of the west tower), by M. G. Bigourdan.—Observations of the same planet made at the Observatory of Algiers (0.50 m. telescope), by M. Ch. Trépied.—Experiments on the propagation of waves along the course of rapid streams: confirmation of the formulas given by M. Boussinesq in his theory on the gradually varied movements of fluids, by M. Bazin.—Note on spectroscopic observations through the medium of radiant matter: mutual extinction of the spectra of yttrium and sanarium, by M. William Crookes. From the numerous anomalies presented during his present experiments, the author draws the important inference that the conclusions of spectrum analysis *per se* are liable to serious error unless at each step the spectroscopist is controlled by the chemist, who represents the last court of appeal.—On the action of cadmium on the nitrate of ammoniac, by M. H. Morin.—Note on the sulphur derived from the persulphuret of hydrogen, by M. Maguene.—Note on the methylate of soda, by M. de Forcrand.—On the degree of volatility in the chloruretted nitrites, by M. L. Henry.—On the pretended elective fermentation, by M. Maumené.—On the geniculated ganglion of birds, by M. L. Magnien. From his researches the author finds that in birds there exists a facial ganglion, which must be assimilated to the geniculated ganglion of the higher vertebrate animals.—Note on the nervous system of the Buccinidae and the Purpuridae, by M. E. L. Bouvier.—Physiology of the composite Ascidiæ belonging to the family of the Diplosomidae, by M. S. Jourdain.—Considerations on the Echinidae of the Jurassic formations in France, by M. Cotteau. Of the fifty genera belonging to the Jurassic formations twenty-four are peculiar to this geological system; four only persist to the Tertiary epoch, and two alone (Cidaris and Stomechinus) survive to the present time.—An attempt to determine the variations in the length of time during which the human body rests on both feet while walking, by M. Demeny.—On the respiration of plants, by MM. G. Boneier and L. Mangin.—Note on the artificial production of Strengite ($\text{Fe}_2(\text{PO}_4)_2 + 4\text{H}_2\text{O}$), by M. A. de Schulten.—Symmetrical disposition of the archaic formations on both sides of the Guadalquivir Valley, by M. J. Macpherson.

BERLIN

Physiological Society, May 15.—Dr. Hölzke spoke of the results of his investigations into intraocular pressure. It having been established that glaucoma was developed in the eye through pathologically increased pressure, the question of physiological pressure in the eye was of high practical importance. Yet was Herr Grünhagen the first, by means of a canula introduced into the anterior chamber of the eye, and a fine mercurial manometer connected with it, to measure the magnitude of this pressure in the eye of a cat and to determine its variations. He found the living cat's eye showing a pressure of 26 mm., which, on the death of the animal, sank to 10 mm. Everything increasing the blood-pressure was found to augment at the same time the intraocular pressure, while, on the other hand, everything lowering the pressure in the province of the carotid artery was found to lessen the pressure in the chamber of the eye. Stimulation of the trigemini raised the intraocular pressure considerably, as did likewise stimulation of the medulla oblongata, which pushed the pressure up to as high even as 200 mm. The effect of atropine was a diminution of pressure. A few later observers had, with somewhat modified manometers, attained like results for the influence of the blood-pressure and deviating results for that of

the nerves and the alkaloids. Dr. Hölzke had in his investigations, which first of all referred to the effect of the alkaloids atropine, eserine, and pilocarpine, laid special weight on the improvement of the methods, and on one hand had, as a trustworthy measurer of pressure, made use of a double manometer, which he produced and explained to the Society, and on the other hand had confined the application of the alkaloids above mentioned to one eye, while the other eye was utilised in the way of control in the process of the measurements which were always carried out in both eyes. As the result of the measurements it was ascertained that eserine produced at first a considerable augmentation of the pressure, and then an abatement of it to a point below the normal value. Pilocarpine produced similar, but more reduced results; while atropine called forth quite the contrary effects. The speaker had further determined the pressure, still more directly concerned in the case of the production of glaucoma, in the vitreous humour, by means of a special canula, and with the same measurer of pressure. In this case he had found the pressure, both under normal conditions, as also under the operation of the alkaloids, and the changes of pressure in the blood, to be always similar to the pressure in the anterior chamber of the eye.—Dr. Virchow described the relation of the blood-vessels of the vitreous humour in cyprinoids. After having shown that the occurrence of blood-vessels in the vitreous body, and its absence from the retina was not a distinguishing character of the amphibia, seeing that blood-vessels in the vitreous humour were wanting in the case of many amphibia and reptiles, as also in the lowest fishes, while in other classes of amphibia such blood-vessels were to be found. The speaker commented minutely on the differences in the ramification and diffusion of these blood-vessels, as also the varying arrangement of their capillaries, and demonstrated them on preparations of carps, bleaks, and roaches, as well as by enlarged photographs.—Dr. Weyl reported on the negative results of experiments having for their object to ascertain the mode of nitrates in the animal body. It was a well-known fact that nitrates occurred in human urine, but were regularly wanting in the urine of dogs. By feeding dogs with ammoniacal citric acid a nitrate formation was not produced, not even when, along with the ammonia, a fixed alkali was administered by way of combining the acids arising under the flesh aliment. Only in a pathological case, in which a dog that had received ammonia died of a disease of the intestine and the kidneys, was nitrate found in the urine; consequently neither the mode of the formation of nitrates in the organism nor the cause of the difference between man and dog in this respect had been ascertained. For the demonstration of nitrates in the urine the speaker recommended distilling the urine with sulphuric acid, and treating the distillation with one of the many reagents of nitric oxide.—Dr. Friedländer demonstrated a case of carcinoma hitherto never observed in a pulmonary cavern. The carcinoma adhered firmly to the wall of the tubercular cavity, sent a stalk through the next branch, and at the stalk hung a somewhat large carcinomatous swelling in the bifurcation. The carcinoma was a horny carcinoma which was regularly observed at those places where stratified flattened epithelium occurred; on other membranes horny cancer had hitherto never been observed. So much the more striking, therefore, was it to find horny carcinoma in the lungs. This riddle perhaps found its explanation in two observations noted down in the literature of the subject, according to which defects in mucous membranes caused by abscesses, once in the lungs and once in the corpus uteri, became healed over by flattened epithelium instead of by cylindroid or ciliated cells. It was possible that the cavity occurring in this case also had covered itself with flattened epithelium which had become the starting-point for the horny carcinoma.

Physical Society, May 21.—Dr. Kayser demonstrated a new cathetometer constructed by Herr Bamberg, explained the arrangement of it, and set forth as its special advantages the facility of placing it vertically and the circumstance that after precise adjustment, by merely changing the eye-pieces, the instrument could be used both as a microscope and a telescope, without at all altering its position for the least as for the greatest distances.—Prof. Neesen sketched a very simple arrangement for demonstrating the effect of the lightning-conductor, which was particularly well qualified for class experiments.—Dr. König discussed the principle according to which he was getting a new spectro-photometer made, which he showed to the Society, provisionally put together. The instrument consisted in the main of

an objective tube containing a lens and a diaphragm turned towards the source of light with two slits lying above each other, a prism for decomposing the two bundles of incident rays, and a second collimator tube, on the lid of which closing the end appeared two spectra showing an interval between them. Before the lens of the ocular collimator was placed a twin prism, the two prisms of which with their refracting edges of 1° to 2° were cemented together. By this twin prism each spectrum was decomposed into two spectra, and the dimensions of the twin prism were determined in such a manner that on the lid of the collimator one spectrum was situated above, the other below, while in the middle the second spectrum of the upper slit coincided with the second spectrum of the lower slit. In the lid of the ocular tube let a small opening be made cutting off a small piece of determinate wave-length from the double spectrum; on looking through it the field of vision would be seen divided by a line (the refracting edges of the twin prism) into two halves, both of the same colouring. Before each of the two slits of the objective tube through which the light entered was placed a Nicol prism in such a position that perpendicularly polarised light entered one slit and horizontally polarised light the other. The middle compound spectrum consisted, therefore, of a perpendicularly and a horizontally polarised spectrum, and in the field of vision the two like-coloured halves were also polarised perpendicularly to each other. If now the field of vision was viewed, not directly, but through a Nicol prism, then, according to the position of this prism would the one half at one time, the other half at another time, be withdrawn from sight; and if the two entering rays of light or their spectra possessed different degrees of intensity, by turning the ocular-Nicol the two halves of the field of vision could be made equal, and from the rotation the relative degrees of intensity of the two bundles of rays could be determined.

VIENNA

Imperial Academy of Sciences, April 16.—Studies on the fauna of eighteen smaller and larger Austrian freshwater basins, by O. E. Imhof.—On the action of potassium permanganate on hyposulphite of soda, by M. Gläser.—On orthoclase as a dry mineral in basalt, by V. v. Zepharowich.—On jointed milk-sap vessels in the fruit of *Lactarius deliciosus*, by A. Weiss.—On the relation of Weber's theory of electro-dynamics to Hertz's principles of the unity of electric forces, by E. Aulinger.—A contribution to knowledge of the fishes of Turonian system of Bohemia, by G. Laube.—On the astronomical data found in Assyrian inscriptions, by T. Oppert.—On a new method for determination of the size of molecules, by F. Exner.—On a new trinitrophenol, by T. Zehenter.—Astronomical researches on the Egyptian eclipse referred to in the Bible, by E. Mahler.

April 23.—On spectrographical experiments on normal light sources, and on the applicability of the latter for photo-chemical measurement of light-sensibility, by T. M. Eder.—The knowledge of the anatomical structure of our Lorantheae, by G. Marktanner-Turneretscher.—Researches on chelidonic acid, by L. Haitinger and A. Lieben.

May 7.—On the manufacturing and qualitative composition of zirkon, by E. Linnemann.—Systematic zoological studies, by F. Brauer.—On artificial uric and methylated uric acids, by T. Horbaczewsky.—On polaristrobometric methods, especially on "polarimètres à pénombres," by F. Lippich.—Contributions to a knowledge of the cobalt ammonium compounds, by G. Voltmann.—On the knowledge of the structure of the Libanon and Antilibanon, by E. Suess.—On the solution of Kepler's problem, by Th. von Oppolzer.—On the chlorhydrines of buteryl-glycerin, by A. Lieben.—On a crocodile skull found in the Tertiary deposits of Eggenburg, Lower Austria, by F. Toulou and A. Kail.

May 14.—On the product of oxidation of propylene oxide by silver oxide, by E. Linnemann.—Preliminary communication on the fluorescence of the dyeing matters of fungi, by A. Weiss.—The knowledge of the structure of the muscles of insects, by R. von Limbeck.—On the sinus cavernosus of Dura mater, by C. von Langer.—On papaverine, by V. Barth and G. Goldschmidt.

May 20.—Prof. Stefan was elected Vice-President of the Mathematical Class; Prof. E. Suess, Secretary; Prof. L. Boltzmann (Graz), Prof. V. von Zepharowitsch (Prague), and Prof. C. Claus (Vienna) were elected Members; Prof. Escherich, Prof. A. Vogl, and Franz Exner (Vienna), Correspondents; Prof. A. Bayer (Munich), Prof. T. D. Dana (New Haven), Foreign Correspondents.

May 21.—Anniversary Meeting.—The opening address was held by the Curator's substitute, A. von Schmerling. Then the reports were read by the General Secretary, Prof. Siegel, and by the Secretary of the Mathematical Class, Prof. Stefan. Obituary notes were given by the latter on Hochstetter, Fitzinger, F. von Stein, and Siebold. A prize of 1000 florins was awarded to R. Maly (Graz), for his paper, "Researches on the Oxidation of Albumens by Potassium Permanganate."

STOCKHOLM

Academy of Sciences, May 18.—For the *Transactions* of the Academy were accepted: Researches on the disjunctive electromotive power on the electrodes during the passage of electricity through air of greater or lesser density, by Prof. Edlund; and Ueber die Säugethiergattung Galeopithecus: eine morphologische Untersuchung, by Prof. W. Peche.—Prof. Edlund exhibited and described a specimen of meteorograph of Thorell's construction, made by Herr Sörensen for the Emperor of Brazil.—Prof. Warming gave an account of the botanical researches undertaken by Messrs. L. Y. Neumann and G. A. Tiselius in the Swedish provinces of Jemtland and Medelpad; and (2) contributions to the knowledge of the structure of the pericarp, by Miss Alida Olbers.—Prof. Toréel exhibited and described a geological map of Sweden, on the scale 1:600,000.—The Secretary, Prof. Lindhagen, presented for publication in the *Transactions* the following papers:—The transversal oscillations in a thin crystalline lamina with three plans of symmetry and elliptical limitation, by E. Sundberg.—Alpha-oxazonaphthalin alpha-sulphonacid and some of its salts, by Dr. J. E. Alén.—On two isomeric beta-monochlor-naphthalin-sulphonacids, by Herr K. Arnell.—On mononitro-beta-naphtha-acids, by Dr. A. G. Ekstrand.—Some annotations on microscopic researches on plants, by Dr. A. Malm.—Contributions to the flora of fungi in the southernmost parts of Norway, by Dr. E. Henning.—On Sowerby's whale, by Dr. A. Malm.

CONTENTS

PAGE

The Chittagong Hill Tribes	169
The Meteorology of Bombay	170
Our Book Shelf:—	
Supplement to "Euclid and his Modern Rivals" . .	171
Mojšvár's "Leitfaden bei zoologisch-zootomischen Präparirübungen"	171
Letters to the Editor:—	
On Watering the Coal-Dust in Mines.—W. Gallo-way	171
The Colours of Arctic and Alpine Animals.—Prof. R. Meldola	172
Clifford and Prof. Tait.—R.	173
Unusual Atmospheric Phenomenon.—Alex. Hodgkinson. (Illustrated)	173
Sky-Glows.—Dr. F. A. Forel	173
The International Exhibition—Music Loan Collection. By Dr. W. H. Stone	174
The Measure of Fidget	174
Recent Earthquakes. By William Scarnell Lean; J. Lovell	175
The Scottish Marine Station. By J. T. Cunningham	176
Composite Portraits of Members of the National Academy of Sciences. Raphael Pumpelly	176
How the North-Norway Fjords were made. By Dr. Karl Pettersen	177
Variable Stars	180
Notes	180
Our Astronomical Column:—	
The Periodical Comets of De Vico and Barnard . .	183
The Double-Star 19 (Hev.) Camelopardi	184
A Daylight Occultation of Aldebaran	183
Astronomical Phenomena for the Week 1885, June 28 to July 4	183
Geographical Notes	184
Electrical Definitions, Nomenclature, and Notation. By Prof. Andrew Jamieson, C.E. (Illustrated)	184
The Jubilee of the Statistical Society	188
University and Educational Intelligence	188
Scientific Serials	189
Societies and Academies	189